

Service Manual

Simplified

Color Television

Simplified Manual

NA6LV



Panasonic

Models
CT-2005SB

Chassis
PP326

This Simplified Service Manual is issued to add listed models to the Main Service Manual order No. **MTNC000101C1**. A full set of schematics, disassembly procedures, and a complete parts list are included in this Simplified Manual. Please file and use this Simplified Service Manual together with Main Service Manual, order No. **MTNC000101C1**.


WARNING! This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. **Products powered by electricity should be serviced or repaired only by experienced professional technicians.** Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death."

The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in the Main Manual.

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Important Safety Notice

Special components are used in this television set which are important for safety. These parts are identified on the schematic diagram by the symbol  and printed in **BOLD TYPE** on the replacement part list. It is essential that these critical parts are replaced with the manufacturer's specified replacement part to prevent X-ray radiation, shock, fire or other hazards. Do not modify the original design without the manufacturer's permission.

Safety Precautions

General Guidelines

An **Isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the Receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always Replace Protective Devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the Receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this Receiver is operating. Operation of the Receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high-voltage equipment.

Extreme care should be practiced when **Handling the Picture Tube**. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. **Discharge the picture tube** by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe.

Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to X-ray radiation.

The **Test Picture Tube** used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against X-ray radiation as well as implosion. The magnetic shield limits the X-ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling **33.96kV** without causing X-ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. **Do not use a line isolation transformer when testing.**

Leakage Current Cold Check

Unplug the AC cord and connect a jumper between the two plug prongs.

Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads,

antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240k Ω and 5.2M Ω . If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage Current Hot Check (Fig. 1)

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5k Ω 10 watt resistor in parallel with a 0.15 μ F capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson Model 229, Sencore Model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 1/2 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the Receiver must be repaired and rechecked before it is returned to the customer.

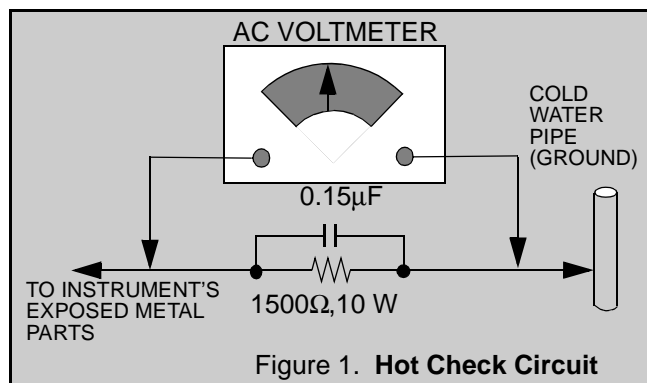


Figure 1. Hot Check Circuit

X-ray Radiation

WARNING: The potential source of X-ray radiation in the TV set is in the High Voltage section and the picture tube.

Note: *It is important to use an accurate, calibrated high voltage meter.*

Set the **brightness, picture, sharpness** and **color** controls to Minimum.

Measure the High Voltage. The high voltage should be **27.7kV \pm 1.25kV**. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Horizontal Oscillator Disable Circuit Test

This test must be performed as a final check before the Receiver is returned to the customer. See **Horizontal Oscillator Disable Circuit Procedure Check** in this manual.

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Service Notes

Note: These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

Leadless Chip Component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code - 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper). Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

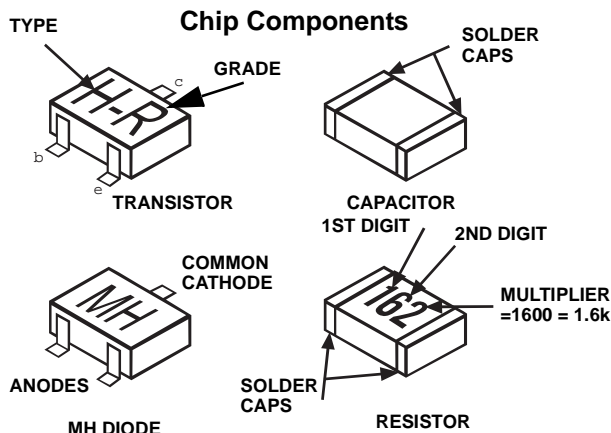
Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

Component Removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

Chip Component Installation

1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

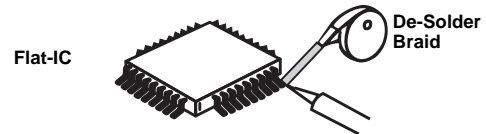


How to Replace Flat-IC

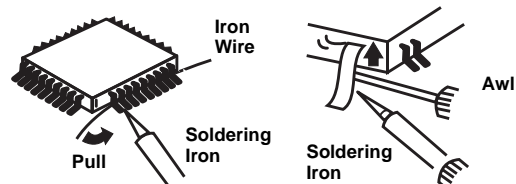
- Required Tools -

- Soldering iron
- De-solder braids
- Iron wire or small awl
- Magnifier

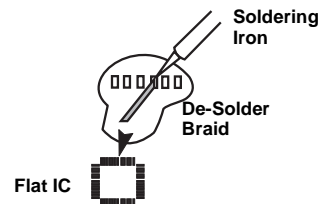
1. Remove the solder from all of the pins of a Flat-IC by using a de-solder braid.



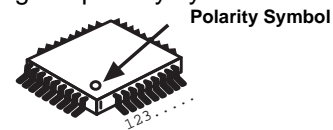
2. Put the iron wire under the pins of the Flat-IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



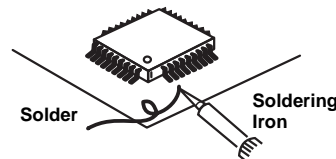
3. Remove the solder from all the pads of the Flat-IC by using a de-solder braid.



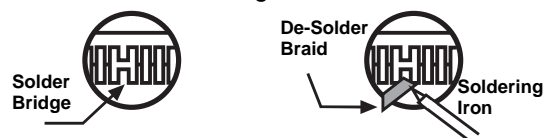
4. Position the new Flat-IC in place (apply the pins of the Flat-IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol.



5. Solder all pins to the soldering pads using a fine tipped soldering iron.



6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de-solder braid as shown in the figure below.




Service Notes (Continued)

IMPORTANT: To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CTR DAG wire are securely connected.


CAUTION: The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the Receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground (∇) or (\nearrow) when servicing, or incorrect voltages will be measured.

WARNING: This Receiver has been designed to meet or exceed applicable safety and X-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to X-ray radiation and shock and fire hazard, parts indicated with the symbol  on the schematic must be replaced with identical parts. Order parts from the manufacturer's parts center using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.

Horizontal Oscillator Disable Circuit

This chassis employs a special circuit to protect against excessive high voltage and beam current. If, for any reason, the high voltage and beam current exceed a predetermined level this protective circuit activates and detunes the horizontal oscillator that limits the high voltage. The over-voltage protection circuit is not adjustable. However, if components indicated by the symbol  on the schematic in either the horizontal sweep system or the over-voltage protection circuit itself are changed, the operation of the circuit should be checked using the following procedure:

Equipment needed to check the disabled circuit:

1. Voltmeter (0 - 200V scale)
2. High Voltage Meter (0- 50kV)
3. Variac or Isolation Transformer

Procedure:

1. Tune in a station to verify that the horizontal is in sync.
 2. Obtain a Monoscope pattern or a signal generator crosshatch pattern
 3. Connect the voltmeter (-) lead to TPD2 and the (+) lead to TPD1 (junction of D555 anode, R556 & R557). Set **Bright** level to (0) and **Picture** for a 1.8 volt reading on the voltmeter.
 4. Turn the Receiver OFF. Connect a jumper across IC803 pin 3 and pin 4. Apply +9V DC to cathode of D001.
 5. Reduce the AC supply voltage to approximately 45V. Connect the high voltage meter to the CRT anode. (H.V. button).
- Note:** Use the Dag Ground (C10 on the CRT Board) to connect the (-) lead of the meter.
6. Turn the Receiver ON. Slowly increase the AC supply voltage and verify that the high voltages does not exceed **34.0kV** when horizontal just begins to pull out of sync. If the high voltage is not within the specified limit, the cause must be determined and corrected before the Receiver is returned to the customer.

Receiver Feature Table

FEATURE\MODEL	CT-2005SB
Chassis	NA6LV
Tuning system	40K
# of channels	181
Menu language	Eng/Span/Fr
Closed Caption	X
V-Chip	X
75 Ω input	X
Remote Model #	EUR501450
Picture tube	A51KQN011X
Notch filter	P
V/A norm (X=both)	V
MTS/SAP/DBX	X
AI Sound (DXL:*,SMPL:X)	X
Built-in audio power	1.5Wx2 (10%)
# of speakers	2
Audio out(FAO:F,VAO:V)	V
A/V in (rear/front)	1/1
HPJ/HPJ/MISC	HPJ
Dimensions mm (WxDxH) in	516x492x462 20.28x19.33x18.15
Weight (kg/lbs)	20.09/44.28
Power source (V/Hz)	120/60
Anode voltage	27.7kV \pm 1.25kV
Video input jack	1V _{p-p} 75 Ω , phono jack
Audio input jack	500mV RMS 47k Ω
A-Board TNP2AH018	CB
C-Board TNP2AA062	AA

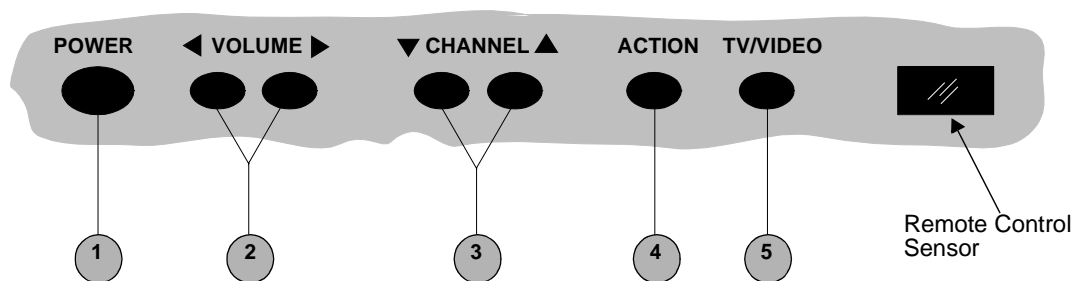
Table 1. Receiver Features

Specifications are subject to change without notice or obligation.
Dimensions and weights are approximate.

Location of Controls (Receiver)



Figure 2. Location of Controls (Typical receiver).



Quick Reference Control Operation

Quick Reference Control Operation	
1	Power Button - Press to turn ON or OFF.
2	Volume Buttons - Press to adjust Sound Level, or to adjust Audio Menus, Video Menus, and select operating features when menus are displayed
3	Channel Buttons - Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select Cable Converter box channels after programming Remote Control Infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
4	Action Button - Press to display Main Menu and access On Screen feature and Adjustment Menus.
5	TV/Video Button - Press to select TV or one of two Video Inputs, for the Main Picture or the PIP frame (when PIP frame is displayed).

Location of Controls (Remote)



EUR501450

Power Button
Press to turn ON and OFF.
Mute Button
Press to mute sound. A second press resumes sound. Press also to access and delete Closed Caption display.
TV/Video Button
Press to select TV or Video input.
Volume Buttons
Press to adjust TV sound level. Use with Channel buttons to navigate in menus.
Channel Buttons
Press to select channels. Use with volume buttons to navigate in menus.
Action Button
Press to display Main Menu and access or exit On Screen features and Adjustment Menus.
Keypad Buttons
Press desired channel number to randomly access any channel.
R-Tune (Rapid Tune) Button.
Press to switch to the previous channel.
Recall Button
Press to display Time, status of Sleep Timer, Channel, Video mode and Channel Caption (Station Identifier).

Figure 3. Location of Controls (Remote)

Note: For more information and details about this Remote, refer to the Remotes Guides, parts number: TQB2AA7057 and TQB2AA7068.

Component Identification

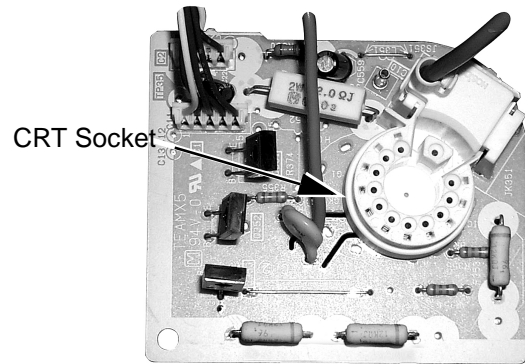


Figure 4. C Board.d10

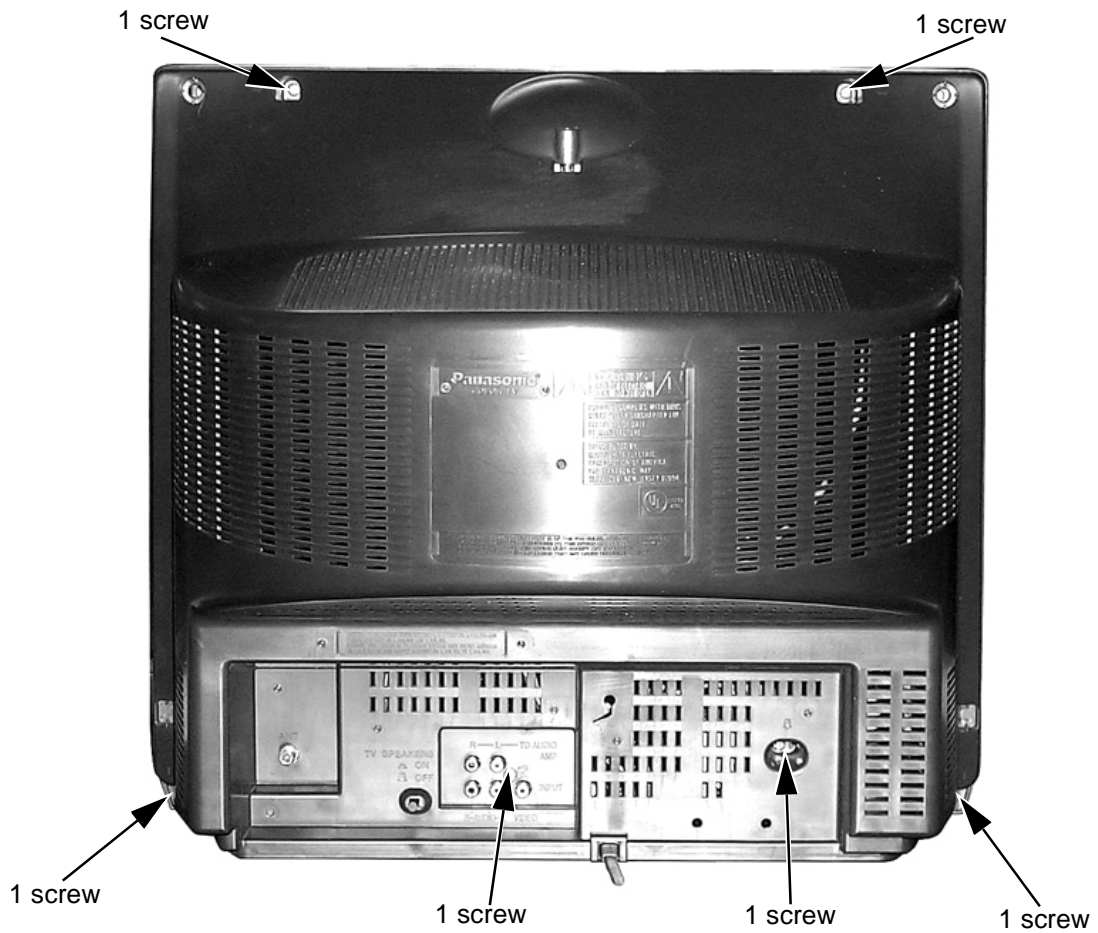


Figure 5. Back of Television.(d10)

Component Identification (cont.)

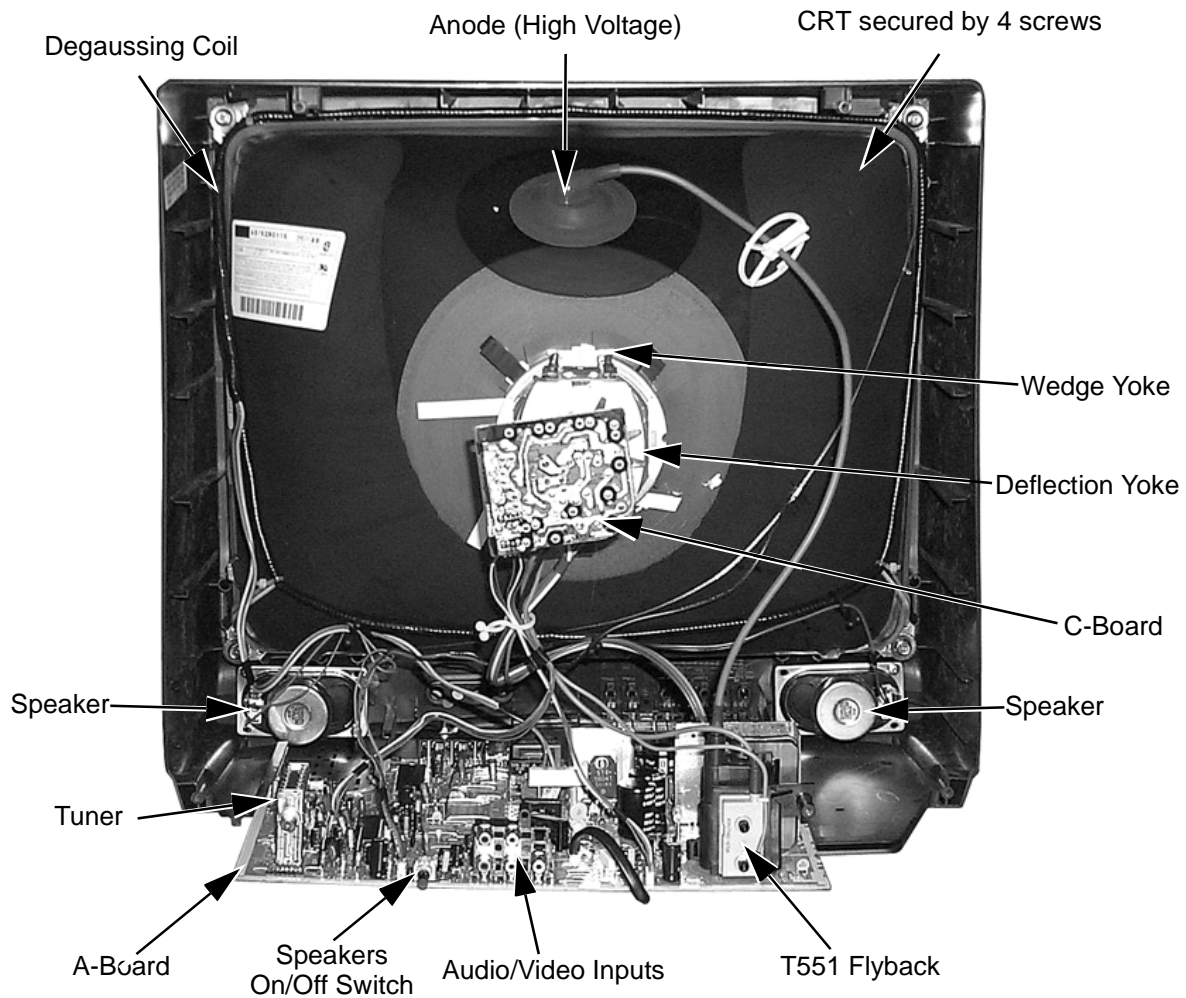


Figure 6. Television's rear view with cover removed.

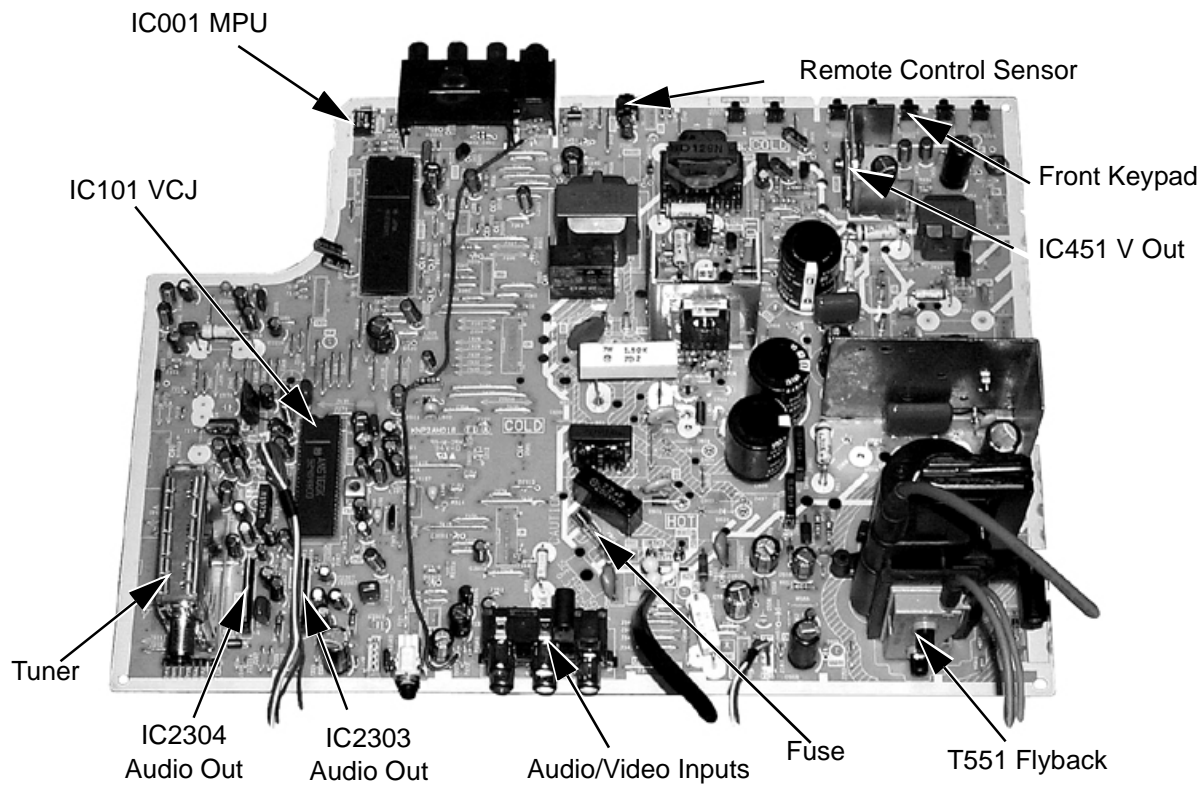


Figure 7. Main Board.

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
CAPRISTORS			C110	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
CRA801	EXNFGV	RES-CAP	C111	ECA1EM100	CAP,E 10UF/25V
CRA802	EXNFGV	RES-CAP	C113	ECA1EM100	CAP,E 10UF/25V
CAPACITORS			C117	ECJ2VC1H120J	CAP,C 12PF-J-50V
C001	ECA1AM101	CAP,E 100UF/10V	C151	ECA1HMR22	CAP,E .22UF/50V
C003	ECA1HM4R7	CAP,E 4.7UF/50V	C201	ECJ2VF1H103Z	CAP,C .01UF-Z-50V
C004	ECJ2VC1H330J	CAP,C 33PF-J-50V	C202	ECJ2VC1H101J	CAP,C 100PF-J-50V
C005	ECJ2VC1H330J	CAP,C 33PF-J-50V	C203	ECA1HM4R7	CAP,E 4.7UF/50V
C008	ECJ2VF1H104Z	CAP,C .1UF-Z-50V	C301	ECJ2VC1H390J	CAP,C 39PF-J-50V
C010	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C302	EEANA1E1R0B	CAP,E 1.0UF-25V
C011	ECA1CM221	CAP,E 220UF/16V	C304	ECEA1HNR47U	CAP,E .47UF-50V
C013	ECA0JM101	CAP,E 100UF/6.3V	C305	ECA1HM4R7	CAP,E 4.7UF/50V
C016	ECJ2VC1H101J	CAP,C 100PF-J-50V	C306	ECA1CM221	CAP,E 220UF/16V
C017	ECJ2VC1H220J	CAP,C 22PF-J-50V	C308	ECQB1H823JM	CAP,P .082UF-J-50V
C018	ECJ2VC1H220J	CAP,C 22PF-J-50V	C309	ECA1AM101	CAP,E 100UF/10V
C019	ECA0JM101	CAP,E 100UF/6.3V	C310	ECA1HM4R7	CAP,E 4.7UF/50V
C020	ECA0JM101	CAP,E 100UF/6.3V	C311	ECA1HM4R7	CAP,E 4.7UF/50V
C022	ECA1CM471	CAP,E 470UF/16V	C312	ECA1EM220	CAP,E 22UF/25V
C024	ECA1HM4R7	CAP,E 4.7UF/50V	C314	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C025	ECJ2VC1H101J	CAP,C 100PF-J-50V	C351	ECJ2VB1H391K	CAP,C 390PF-K-50V
C026	ECA1HM010	CAP,E 1.0UF/50V	C352	ECJ2VB1H391K	CAP,C 390PF-K-50V
C031	ECJ2VB1H821K	CAP,C 820-J-50V	C353	ECJ2VB1H471K	CAP,C 470PF-K-50V
C032	ECA1AM470	CAP,E 47UF/10V	C354	ECKD3D102KB	CAP,C .001UF-K-2KV
C033	ECJ2VC1H101J	CAP,C 100PF-J-50V	C357	EEANA1E1R0B	CAP,E 1.0UF-25V
C035	ECJ2VC1H220J	CAP,C 22PF-J-50V	C401	ECQB1H153JM	CAP,P .015UF-J-50V
C036	ECJ2VC1H220J	CAP,C 22PF-J-50V	C402	ECJ2VB1H471K	CAP,C 470PF-K-50V
C037	ECJ2VC1H220J	CAP,C 22PF-J-50V	C403	ECA1HM2R2	CAP,E 2.2UF/50V
C038	ECJ2VC1H220J	CAP,C 22PF-J-50V	C451	ECA1AM470	CAP,E 47UF/10V
C101	ECJ2VF1H223Z	CAP,C .022UF-Z050V	C452	ECSF1EE105	CAP,T 1.0UF/25V
C102	ECA1EM100	CAP,E 10UF/25V	C453	ECEA1HFS2R2	CAP,E 2.2UF/50V
C103	ECUX1H300JCX	CAP,C 30PF-J-50V	C454	ECA1EM102	CAP,E 1000UF/25V
C105	ECJ2VC1H221J	CAP,C 220PF-J-50V	C455	ECA1EHG101B	CAP,E 100UF-25V
C106	ECA1HMR47	CAP,E .47UF/50V	C456	ECQB1H103JM	CAP,P .01UF-J-50V
C107	ECJ2VC1H390J	CAP,C 39PF-J-50V	C459	ECA1VM471	CAP,E 470UF/35V
C108	ECA1HMR22	CAP,E .22UF/50V	C462	ECA1EM100	CAP,E 10UF/25V
C109	EEANA1E4R7B	CAP,E 4.7UF-25V	C502	ECQB1H223JM	CAP,P .022UF-J-50V

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
C503	ECA1HM2R2	CAP,E 2.2UF/50V	C801	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC
C504	ECJ2VC1H101J	CAP,C 100PF-J-50V	C802	ECKDAE472ZED	CAP,C .4700PF-Z-250VAC
C505	ECJ2VU1H221J	CAP,C 220PF-J-50V	C805	EC0S2DG151DG	CAP,E 151UF/200V
C506	ECA1CM221	CAP,E 220UF/16V	C806	EC0S2DG151DG	CAP,E 151UF/200V
C507	ECJ2VC1H221J	CAP,C 220PF-J-50V	C807	ECA1HM4R7	CAP,E 4.7UF/50V
C508	ECJ2VC1H121J	CAP,C 120PF-J-50V	C808	ECA1CM101	CAP,E 100UF/16V
C510	ECCD2H100D	CAP,C 10PF-D-500V	C809	EC0S2DG151DG	CAP,E 151UF/200V
C511	ECKD2H821KB	CAP,C 820PF-K-500V	C810	ECQU2A153MV	CAP,P .015UF-M-250V
C512	ECKD2H101KB	CAP,C 100PF-K-500V	C811	ECQU2A153MV	CAP,P .015UF-M-250V
C531	ECA1EM220	CAP,E 22UF/25V	C812	ECQU2A224MV	CAP,P .22UF-M-250VAC
C532	ECA1AM102	CAP,E 1000UF/10V	C814	ECQB1H333JM	CAP,P .033UF-J-50V
C533	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C815	ECA1HHG470B	CAP,E 47UF-50V
C534	ECJ2VF1H103Z	CAP,C .01UF-Z-50V	C818	ECKD3A821KB	CAP,C 820PF-K-1KVDC
C551	ECA1VM331	CAP,E 330UF/35V	C820	ECA1JHG100B	CAP,E 10UF-63V
C552	ECA1EM471	CAP,E 470UF/25V	C823	ECA160V33UE	CAP,E 33UF/160V
C553	ECKD2H561KB	CAP,C 560PF-K-500V	C824	ECKD3A331KB	CAP,C 330PF-K-1KV
C554	ECKD2H561KB	CAP,C 560PF-K-500V	C825	ECKD3A471KB	CAP,C 470PF-K-1KV
C555	ECA2EM220	CAP,E 22UF-250V	C2201	ECA1HM4R7	CAP,E 4.7UF/50V
C556	ECA1CM471	CAP,E 470UF/16V	C2202	ECA1HM2R2	CAP,E 2.2UF/50V
C557	ECKD2H222KB	CAP,C .0022UF-K-500V	C2203	ECA1HM4R7	CAP,E 4.7UF/50V
C559	ECA1HM220	CAP,E 22UF/50V	C2204	AP106K016CAE	CAP,T 10UF/16V
C560	EEANA1E2R2B	CAP,E 2.2UF-25V	C2205	ECA1HMR33	CAP,E .33UF/50V
C561	ECKD2H561KB	CAP,C 560PF-K-500V	C2206	ECQB1H223JM	CAP,P .022UF-J-50V
C563	ECWH12H822JS	CAP,P .0082UF-J-1.2KV	C2207	AP335K016CAE	CAP,T 3.3UF/16V
C564	ECKD3D821JB	CAP,C 820PF-J-2KV	C2208	ECJ2VB1C104K	CAP,C .0033UF-K-50V
C565	ECKD3D821JB	CAP,C 820PF-J-2KV	C2209	ECJ2VB1C104K	CAP,C .0033UF-K-50V
C566	ECKD3D181JB	CAP,C 180PF-J-2KV	C2210	ECJ2VB1C104K	CAP,C .0033UF-K-50V
C569	TACFQ2E394J	CAP,M .39UF-J-200V	C2212	ECQB1H473JM	CAP,P .047UF-J-50V
C571	ECA1EM220	CAP,E 22UF/25V	C2215	ECA0JM101	CAP,E 100UF/6.3V
C572	ECA1EM100	CAP,E 10UF/25V	C2218	ECA1HMR47	CAP,E .47UF/50V
C573	ECA1CM101	CAP,E 100UF/16V	C2220	EEANA1E100B	CAP,E 10UF-25V
C601	ECJ2VC1H181J	CAP,C 180PF-J-50V	C2301	ECA1EM221	CAP,E 220UF/25V
C602	ECJ2VC1H680J	CAP,C 68PF-J-50V	C2302	ECA1HM3R3	CAP,E 3.3UF/50V
C604	ECJ2VU1H150J	CAP,C 15PF-J-50V	C2303	ECA1HM4R7	CAP,E 4.7UF/50V
C605	ECJ2VB1H332K	CAP,C .0033UF-K-50V	C2304	ECQB1H104JM	CAP,P .1UF-J-50V
C606	ECA1HM010	CAP,E 1.0UF/50V	C2306	ECA1CM471	CAP,E 470UF/16V

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
C2307	EEANA1E1R0B	CAP,E 1.0UF-25V	D551	TVSRU2N	DIODE
C2309	ECA1HM010	CAP,E 1.0UF/50V	D553	AU02	DIODE
C2310	ECJ2VB1H222K	CAP,C .0022UF-K-50V	D554	AU02	DIODE
C2311	ECA1HM4R7	CAP,E 4.7UF/50V	D555	MA165	DIODE
C2351	ECA1EM102	CAP,E 1000UF/25V	D556	MA4360H	DIODE, ZENER
C2352	ECA1HM3R3	CAP,E 3.3UF/50V	D560	MA165	DIODE
C2353	ECA1HM4R7	CAP,E 4.7UF/50V	D561	AU02	DIODE
C2354	ECQB1H104JM	CAP,P .1UF-J-50V	D801	GP15KL-042	DIODE
C2356	ECA1CM471	CAP,E 470UF/16V	D802	GP15KL-042	DIODE
C2357	EEANA1E1R0B	CAP,E 1.0UF-25V	D806	MA4056M	DIODE
C2358	ECJ2VB1H222K	CAP,C .0022UF-K-50V	D807	MA165	DIODE
C3001	ECA1HM010	CAP,E 1.0UF/50V	D810	TAP2A102M005	POSISTER, 5 OHM DEGAUSS
C3002	ECA1HM010	CAP,E 1.0UF/50V	D820	EU02V1	DIODE
C3003	ECA1HM010	CAP,E 1.0UF/50V	D821	EU02V1	DIODE
C3005	ECJ2VB1H122K	CAP,C .0012UF-K-50V	D822	EU02V1	DIODE
C3006	ECJ2VB1H122K	CAP,C .0012UF-K-50V	D823	RL30A	DIODE
DIODES			D824	EU02V1	DIODE
D001	ERA15-01	DIODE	D825	TVSSR2KL	DIODE, PROTECTION
D002	MA165	DIODE	D826	EU02V1	DIODE
D003	MA4047H	DIODE	D829	MA165	DIODE
D006	MA4330H	DIODE	D2302	MA165	DIODE
D008	MA165	DIODE	D2312	MA4068M	DIODE, ZENER
D009	MA165	DIODE	D3001	MA165	DIODE
D011	MA165	DIODE	D3002	MA4110M	DIODE, ZENER
D014	MA165	DIODE	D3004	MA4110M	DIODE, ZENER
D015	MA165	DIODE	D3005	MA4110M	DIODE, ZENER
D016	MA165	DIODE	D3016	MA3056M	DIODE
D017	MA165	DIODE	FUSES		
D052	MA4068M	DIODE, ZENER	F801	XBA2A00101	FUSE 6.3A 125V
D451	ERA15-01	DIODE	INTEGRATED CIRCUITS		
D452	MA4047M	DIODE, ZENER	IC001	MN1874088TL3	INT CKT
D453	MA165	DIODE	IC002	M24C04-WBN6	INT CKT
D461	MA27WTA	DIODE	IC003	PIC-26042SR	INT CKT
D501	MA4082L	DIODE	IC101	AN5166K	INT CKT
D531	AS01	DIODE	IC451	LA7837-TV	INT CKT
D532	MA4062L	DIODE	IC551	AN78M09	PLUS 9V AVR

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
IC552	AN78M05	PLUS 5V AVR
IC801	PC817X2	INT CKT
IC803	STR58041A	INT CKT
IC2201	AN5829S-E1V	INT CKT
IC2303	LA4285	INT CKT
IC2304	LA4285	INT CKT
COILS		
L001	TLTABT2R2K	COIL, PEAKING 2.2UH
L002	ELESN390KA	COIL, PEAKING 39UH
L003	TLTABT2R2K	COIL, PEAKING 2.2UH
L004	TLTABT2R2K	COIL, PEAKING 2.2UH
L006	EXCELSA24T	FERRITE BEAD
L008	TLTABT470K	COIL, PEAKING 47UH
L009	EXCELSA35	FERRITE BEAD
L012	EXCELSA24T	FERRITE BEAD
L013	EXCELSA35	FERRITE BEAD
L014	ELESN471JA	COIL, PEAKING 470UH
L103	ELESN150JA	COIL, PEAKING 15UH
L104	TLTABT1R0K	COIL, PEAKING 1.0UH
L105	EIV7EN053B	COIL, VCO
L106	ELESN180JA	COIL, PEAKING 18UH
L551	ELH5L4101	COIL
L602	ELESN120JA	COIL, PEAKING 12UH
L801	ELF15N013A	LINE FILTER
L802	ELEIE680KA	COIL, PEAKING 68UH
L804	EXCELSA39	FERRITE BEAD
L2301	EXCELDR25C	FERRITE BEAD
L2302	TLTABT4R7K	COIL, PEAKING 4.7UH
TRANSISTORS		
Q001	2SD601ARTX	TRANSISTOR
Q002	2SC1685QRS	TRANSISTOR
Q003	2SB709ARTX	TRANSISTOR
Q004	2SB709ARTX	TRANSISTOR
Q302	2SD601ARTX	TRANSISTOR
Q304	2SD601ARTX	TRANSISTOR
Q351	2SC3063	TRANSISTOR

REF NO.	PART NO.	DESCRIPTION
Q352	2SC3063	TRANSISTOR
Q353	2SC3063	TRANSISTOR
Q430	2SD601ARTX	TRANSISTOR
Q451	2SD601ARTX	TRANSISTOR
Q452	2SD601ARTX	TRANSISTOR
Q501	2SC1573AH	TRANSISTOR
Q551	2SD2499MA2	TRANSISTOR
Q801	2SC1685RSTA	TRANSISTOR
Q802	2SC1685RSTA	TRANSISTOR
Q804	2SA1767Q	TRANSISTOR
Q2309	2SB709ARTX	TRANSISTOR
Q3001	2SD601ARTX	TRANSISTOR
RELAYS		
RL801	TSEH0005	RELAY
RESISTORS		
R002	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R003	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R004	ERDS1TJ181	RES,C 180-J-1/2
R005	ERJ6GEYJ101	RES,M 100-J-1/10
R006	ERJ6GEYJ102	RES,M 1K-J-1/10
R007	ERJ6GEYJ102	RES,M 1K-J-1/10
R008	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R010	ERJ6GEYJ154	RES,M 150K-J-1/10
R011	ERJ6GEYJ684	RES,M 680K-J-1/10
R012	ERJ6GEYJ473	RES,M 47K-J-1/10
R014	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R015	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R016	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R017	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R020	ERJ6GEYJ564	RES,M 560K-J-1/10
R021	ERJ6GEYJ101	RES,M 100-J-1/10
R022	ERJ6GEYJ101	RES,M 100-J-1/10
R023	ERJ6GEYJ102	RES,M 1K-J-1/10
R025	ERJ6GEYJ223	RES,M 22K-J-1/10
R027	ERJ6GEYJ103	RES,M 10K-J-1/10
R028	ERJ6GEYJ103	RES,M 10K-J-1/10

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
R030	ERJ6GEYJ102	RES,M 1K-J-1/10	R306	ERJ6ENF1651	RES,M 1.65K-F-1/10
R032	ERJ6ENF1002	RES,M 10K-F-1/10	R307	ERJ6GEYJ564	RES,M 560K-J-1/10
R033	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R308	ERJ6GEYJ102	RES,M 1K-J-1/10
R034	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R309	ERJ6GEYJ333	RES,M 33K-J-1/10
R035	ERJ6GEYJ332	RES,M 3.3K-J-1/10	R310	ERJ6GEYJ223	RES,M 22K-J-1/10
R036	ERJ6GEYJ562	RES,M 5.6K-J-1/10	R311	ERJ6GEYJ185	RES,M 1.8MEG-J-1/10W
R037	ERJ6GEYJ103	RES,M 10K-J-1/10	R317	ERJ6GEYJ684	RES,M 680K-J-1/10
R038	ERJ6GEYJ223	RES,M 22K-J-1/10	R319	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R039	ERJ6GEYJ102	RES,M 1K-J-1/10	R320	ERJ6GEYJ102	RES,M 1K-J-1/10
R046	ERJ6GEYJ102	RES,M 1K-J-1/10	R351	ERG2FJ123H	RES,M 12K-J-2W
R048	ERJ6GEYJ221	RES,M 220-J-1/10	R352	ERG2FJ123H	RES,M 12K-J-2W
R049	ERJ6GEYJ221	RES,M 220-J-1/10	R353	ERG2FJ123H	RES,M 12K-J-2W
R053	ERJ6GEYJ103	RES,M 10K-J-1/10	R354	ERDS1TJ272	RES,C 2.7K-J-1/2
R055	ERJ6GEYJ103	RES,M 10K-J-1/10	R355	ERDS1TJ272	RES,C 2.7K-J-1/2
R060	ERJ6GEYJ102	RES,M 1K-J-1/10	R356	ERDS1TJ272	RES,C 2.7K-J-1/2
R065	ERJ6GEYJ471	RES,M 470-J-1/10	R357	ERJ6GEYJ331	RES,M 330-J-1/10
R066	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R358	ERJ6GEYJ331	RES,M 330-J-1/10
R067	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R359	ERJ6GEYJ331	RES,M 330-J-1/10
R068	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R360	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R070	ERJ6GEYJ101	RES,M 100-J-1/10	R361	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R101	ERJ6GEYJ750	RES,M 75-J-1/10	R362	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R102	ERJ6GEYJ683	RES,M 68K-J-1/10	R363	ERJ6GEYJ101	RES,M 100-J-1/10
R103	ERJ6GEYJ183	RES,M 18K-J-1/10	R364	ERJ6GEYJ101	RES,M 100-J-1/10
R104	ERJ6GEYJ561	RES,M 560-J-1/10	R365	ERJ6GEYJ101	RES,M 100-J-1/10
R105	ERJ6GEYJ561	RES,M 560-J-1/10	R401	ERJ6GEYJ102	RES,M 1K-J-1/10
R107	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R430	ERJ6GEYJ103	RES,M 10K-J-1/10
R108	ERJ6GEYJ471	RES,M 470-J-1/10	R432	ERJ6GEYJ102	RES,M 1K-J-1/10
R152	ERJ6GEYJ183	RES,M 18K-J-1/10	R451	ERDS1FJ1R2	RES,C 1.2-J-1/2
R153	ERJ6GEYJ223	RES,M 22K-J-1/10	R454	ERJ6GEYJ473	RES,M 47K-J-1/10
R154	ERJ6GEYJ393	RES,M 39K-J-1/10	R455	ERJ6GEYJ153	RES,M 15K-J-1/10
R201	ERJ6GEYJ471	RES,M 470-J-1/10	R456	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R202	ERJ6GEYJ682	RES,M 6.8K-J-1/10	R457	ERJ6GEYJ911	RES,M 910-J-1/10
R203	ERJ6GEYJ222	RES,M 2.2K-J-1/10	R458	ERJ6GEYJ273	RES,M 27K-J-1/10
R303	ERJ6GEYJ682	RES,M 6.8K-J-1/10	R459	ERJ6GEYJ683	RES,M 68K-J-1/10
R304	ERJ6GEYJ332	RES,M 3.3K-J-1/10	R460	ERDS2TJ102	RES,C 1K-J-1/4
R305	ERJ6ENF3001	RES,M 3K-F-1/10	R462	ERJ6GEYJ473	RES,M 47K-J-1/10

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R463	ERJ6GEYJ473	RES,M 47K-J-1/10
R465	ERJ6GEYJ103	RES,M 10K-J-1/10
R466	ERJ6GEYJ103	RES,M 10K-J-1/10
R467	ERJ6GEYJ104	RES,M 100K-J-1/10
R468	ERJ6GEYJ101	RES,M 100-J-1/10
R469	ERJ6GEYJ220	RES,M 22-J-1/10
R470	ERDS2TJ152	RES,C 1.5K-J-1/4
R471	ERJ6GEYJ223	RES,M 22K-J-1/10
R501	ERJ6GEYJ102	RES,M 1K-J-1/10
R502	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R503	ERJ6GEYJ822	RES,M 8.2K-J-1/10
R504	ERJ6GEYJ821	RES,M 820-J-1/10
R505	ERJ6GEYJ472	RES,M 4.7K-J-1/10
R506	ERJ6GEYJ182	RES,M 1.8K-J-1/10
R507	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R508	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R509	ERDS2TJ331	RES,C 330-J-1/4
R510	ERG3FJ202H	RES,M 2K-J-3W
R512	ERG2FJ562H	RES,M 5.6K-J-2W
R531	ERD25FJ470	RES,C 47-J-1/4
R532	ERJ6ENF4702	RES,M 47K-F-1/10
R533	ERJ6ENF1502	RES,M 15K-F-1/10W
R536	ERJ6GEYJ223	RES,M 22K-J-1/10
R537	ERJ6GEYJ473	RES,M 47K-J-1/10
R551	ERDS1FJ1R0	RES,C 1.0-J-1/2
R552	ERDS1FJ1R0	RES,C 1.0-J-1/2
R553	ERDS1FJ1R0	RES,C 1.0-J-1/2
R555	ERDS1FJ101	RES,C 100-J-1/2
R556	ERJ6GEYJ222	RES,M 2.2K-J-1/10
R557	ERJ6GEYJ103	RES,M 10K-J-1/10
R558	ERQ2CJP2R2	RES,F 2.2-J-2W
R559	ERG2FJ683H	RES,M 12K-J-2W
R560	ERDS1FJ182	RES,C 1.8K-J-1/2
R562	ERG3FJ680H	RES,M 68-J-3W
R563	ERDS2TJ124	RES,C 120K-J-1/4
R564	ERDS2TJ104	RES,C 100K-J-1/4

REF NO.	PART NO.	DESCRIPTION
R565	ERJ6GEYJ103	RES,M 10K-J-1/10
R567	ERG2FJ122H	RES,M 12K-J-2W
R602	ERJ6GEYJ331	RES,M 330-J-1/10
R603	ERJ6GEYJ331	RES,M 330-J-1/10
R604	ERJ6GEYJ331	RES,M 330-J-1/10
R614	ERJ6GEYJ332	RES,M 3.3K-J-1/10
R801	ERF7ZK1R5	RES,W 1.5-K-7W
R805	ERDS2TJ274	RES,C 270K-J-1/4
R806	ERDS2TJ274	RES,C 270K-J-1/4
R808	ERDS1FJ1R5	RES,C 1.5-J-1/2
R809	ERDS1FJ1R5	RES,C 1.5-J-1/2
R810	ERDS1FJ272	RES,C 2.7K-J-1/2
R812	ERDS1TJ183	RES,C 18K-J-1/2
R813	ERJ6GEYJ562	RES,M 5.6K-J-1/10
R815	ERC12ZGM825	RES,S 8.2MEG-M-1/2
R817	ERX3FJ4R7	RES,M 4.7-J-3W
R820	ERJ6GEYJ153	RES,M 15K-J-1/10
R821	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R822	ERD50FJ474	RES,C 470K-J-1/2W
R823	ERDS2TJ222	RES,C 2.2K-J-1/4
R824	ERG3FJ680	RES,M 68-J-3W
R825	ERJ6GEYJ102	RES,M 1K-J-1/10
R826	ERF2AKR33	RES,W .33-K-2W
R827	ERDS1FJ561	RES,C 560-J-1/2
R828	ERG3FJ470H	RES,M 47-J-3W
R829	ERQ14AJ270	RES,F 27-J-1/4
R2201	ERJ6GEYJ224	RES,M 220K-J-1/10
R2206	ERJ6GEYJ102	RES,M 1K-J-1/10
R2207	ERJ6GEYJ102	RES,M 1K-J-1/10
R2220	ERJ6GEYJ101	RES,M 100-J-1/10
R2301	ERQ2CJP100	RES,F 10-J-2W
R2303	ERD25FJ1R0	RES,C 1.0-J-1/4
R2306	ERJ6GEYJ682	RES,M 6.8K-J-1/10
R2311	ERJ6GEYJ122	RES,M 1.2K-J-1/10
R2312	ERJ6GEYJ392	RES,M 3.9K-J-1/10
R2313	ERJ6GEYJ683	RES,M 68K-J-1/10

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION	REF NO.	PART NO.	DESCRIPTION
R2314	ERJ6GEYJ104	RES,M 100K-J-1/10	CRYSTALS/FILTERS		
R2317	ERJ6GEYJ681	RES,M 680-J-1/10	X001	TSSA010	CRYSTAL
R2318	ERJ6GEYJ103	RES,M 10K-J-1/10	X101	M1972M	FILTER
R2319	ERDS2TJ562	RES,C 5.6K-J-1/4	X102	EFCS4R5MW5BA	FILTER, BANDPASS
R2321	ERJ6GEYJ101	RES,M 100-J-1/10	X201	SFSH4R5MDB	CRYSTAL
R2322	ERJ6GEYJ472	RES,M 4.7K-J-1/10	X501	TAFCSB503F38	CRYSTAL, CLOCK
R2353	ERD25FJ1R0	RES,C 1.0-J-1/4	X601	TSS2AA001	CRYSTAL, 3.58MHZ
R2356	ERJ6GEYJ682	RES,M 6.8K-J-1/10	OTHERS		
R3001	ERJ6GEYJ473	RES,M 47K-J-1/10	M001	A51KQN011X	CRT 20
R3002	ERJ6GEYJ104	RES,M 100K-J-1/10	TNR001	ENV56D51G3	TUNER
R3005	ERJ6GEYJ750	RES,M 75-J-1/10	M002	EUR501450	REMOTE CONTROL
R3006	ERJ6GEYJ391	RES,M 390-J-1/10	M003	TAS2AA0012	SPEAKER 16-OHM 1.5W
R3009	ERJ6GEYJ682	RES,M 6.8K-J-1/10	M004	TBM2A10141	BADGE, PANASONIC
R3010	ERJ6GEYJ334	RES,M 330K-J-1/10	M005	TJSC00300	CRT SOCKET
R3011	ERJ6GEYJ682	RES,M 6.8K-J-1/10	DY	TLY2AA010	DEFLECTION YOKE
R3012	ERJ6GEYJ334	RES,M 330K-J-1/10	M006	TMM2A30702	WEDGE, YOKE
R3013	ERJ6GEYJ682	RES,M 6.8K-J-1/10	M007	TQB2AA0326-1	MANUAL, OWNERS
R3014	ERJ6GEYJ682	RES,M 6.8K-J-1/10	M008	TQB2AA7057	REMOTE GUIDE
R3015	ERDS2TJ181	RES,C 180-J-1/4	M009	TQB2AA7075	V-CHIP CANADIAN
R3016	ERDS2TJ181	RES,C 180-J-1/4	DEG	TSP2AA008	COIL, DEGAUSSING 20
SWITCHES			M010	TSX2AA0110	LINE CORD (SPT2)
S001	EVQPF106K	SWITCH	M011	TXFBX12BSER	ASSY, 7-KEY BUTTON
S002	EVQPF106K	SWITCH	M012	TXFKU06BSER	ASSY, CABINET BACK
S003	EVQPF106K	SWITCH	M013	TXFKY24BSER	ASSY, CABINET FRONT
S004	EVQPF106K	SWITCH	M014	TXF3A011DB2	ASSY. DAG GROUND
S005	EVQPF106K	SWITCH	M015	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
S008	EVQPF106K	SWITCH	JK3001	TJB2A9064B	ASSY. JACK A/V
S009	EVQPF106K	SWITCH	JK3002	TJB2AA0046	TERMINAL, FRONT A/V
TRANSFORMERS					
T001	TLP16297	TRANSFORMER, POWER SUPPLY			
T501	ETH09K8CZ	TRANSFORMER			
T502	ETE19Z30AY	TRANSFORMER, HORIZONTAL COUP			
T551	KFT3AB119F1	FLYBACK TRANSFORMER			
T801	ETS25AD129NC	TRANSFORMER			

REPLACEMENT PARTS LIST

Model: CT-2005SB

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

DESCRIPTION OF ABBREVIATIONS GUIDE

RESISTOR			
TYPE		TOLERANCE	
C	Carbon	F	+/- 1%
F	Fuse	J	+/- 5%
M	Metal Oxide	K	+/- 10%
S	Solid	M	+/- 20%
W	Wire Wound	G	+/- 2%

RES, C 270-J-1/4

CAPACITOR			
TYPE		TOLERANCE	
C	Ceramic	C	+/- 0.25pF
E	Electrolytic	D	+/- 0.5pF
P	Polyester	F	+/- 1pF
S	Styrol	J	+/- 5%
T	Tantalum	K	+/- 10%
		L	+/- 15%
		M	+/- 20%
		P	+10% -0%
		Z	+80% -20%

CAP, P .068UF-K-50V

Notes:

SERVICEMAN MODE (ELECTRONIC CONTROL) SERVICE ADJUSTMENT VALUES

Model _____ Ser # _____ Date _____

Note: Record the original settings PRIOR to modifying the registers.

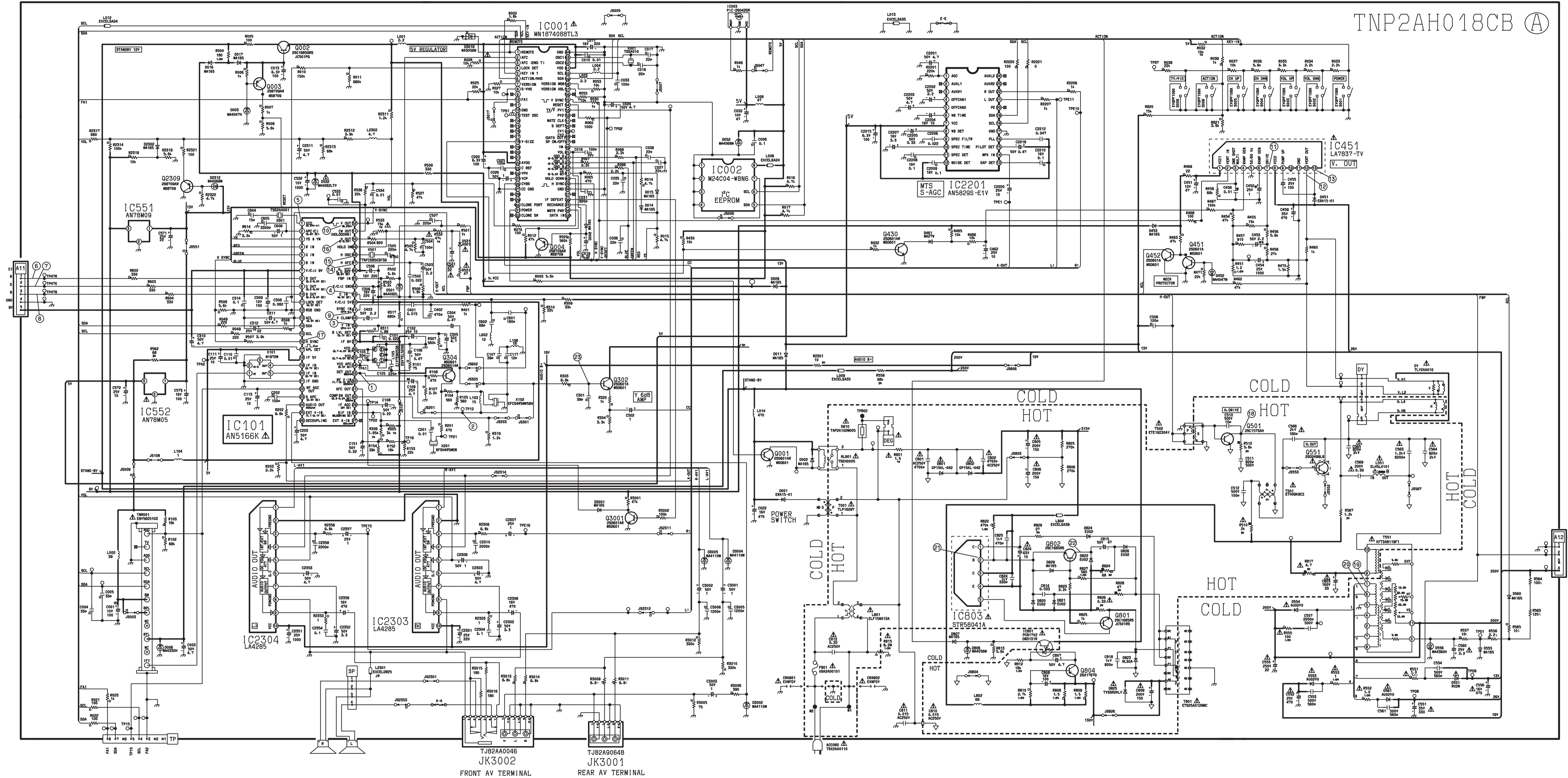
Mode	Service Adjustment	Adjustment Range	Def. Val.	Original Value	New Value
Sub Adjustments					
B0	SUB-COLOR	0 ~ 63	30		
B1	SUB-TINT	0 ~ 63	42		
B2	SUB-BRIGHTNESS	0 ~ 255	35		
B3	SUB-PICTURE	0 ~ 63	26		
B4	KILLER/ABL/ GAMMA	0 ~ 7	5		
B5	VIDEO ADJUSTMENT	0 ~ 15	8		
B6	AUDIO ADJUSTMENT	0 ~ 31	9		
B7	V-SIZE	0 ~ 63	40		
Cut-Off Adjustments					
C0	CUT-OFF R	0 ~ 1 0 ~ 255	0 126		
C1	CUT-OFF G	0 ~ 255	61		
C2	CUT-OFF B	0 ~ 1 0 ~ 255	0 126		
C3	DRIVE R	0 ~ 127	66		
C4	DRIVE B	0 ~ 127	72		
C5	YNR SWITCH	0 ~ 1	0		
C6	AFT	0 ~ 1 0 ~ 255	1 114		
C7	RF-AGC	0 ~ 127	58		
C8	YNR VIDEO ADJUSTMENT	0 ~ 7	0		
C9	HORIZONTAL CENTER	0 ~ 31	11		
Ca	BEAM LIMIT	0 ~ 7	0		
Cb	VCJ TEST H	0 ~ 2	2		
MTS Adjustments					
M0	INPUT LEVEL	0 ~ 63	33		
M1	HIGH-LEVEL SEPARATION	0 ~ 63	25		
M2	LOW-LEVEL SEPARATION	0 ~ 15	6		

Mode	Service Adjustment	Adjustment Range	Def. Val.	Original Value	New Value
Options Adjustments					
S0	PIP COLOR	0 ~ 127	80		
S1	PIP CONTRAST	0 ~ 127	52		
S2	UP 1/9	0 ~ 255	26		
S3	DOWN 1/9	0 ~ 255	146		
S4	LEFT 1/9	0 ~ 255	9		
S5	RIGHT 1/9	0 ~ 255	103		
S6	UP 1/16	0 ~ 255	27		
S7	DOWN 1/16	0 ~ 255	163		
S8	LEFT 1/16	0 ~ 255	9		
S9	RIGHT 1/16	0 ~ 255	118		
Sa	FREERUN	N/A	N/A		
Sb	CLOCK ADJUSTMENT	0 ~ 255	89		
Sc	PIP TINT	0 ~ 63	50		
Sd	LOUDNESS COMPENSATION	0 ~ 63	52		
Comb Filter Adjustments					
X0	COMB GAIN	0 ~ 255	33		
X1	COMB SWITCH	0 ~ 63	12		
X2	COMB LIMIT	0 ~ 63	25		
X3	COMB CORE	0 ~ 127	6		
X4	COMB RF DELAY	0 ~ 127	89		
X5	COMB VIDEO DELAY	0 ~ 127	90		
X6	COMB VMLM	0 ~ 127	34		
X7	COMB VM SW	0 ~ 63	0		
X8	COMB SHARP	0 ~ 255	17		
X9	COMB VM LEVEL	0 ~ 255	255		
Xa	COMB VMPKF	0 ~ 1	0		
Xb	COMB ADJ SHARP	0 ~ 63	0		

Note: Some adjustments modes may not be available in some models depending on available options.

A-Board Schematic - CT-2005SB

TNP2AH018CB (A)



1
2
3
4
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Sheet 1 of 1
Side A

A-Board
CT-2005SB

A-Board Voltage Measurements (ICs and Transistors)

IC001		IC002		IC551		IC101		IC2201		IC2303		Q002		Q003		Q004		Q302	
1	4.56	33	n.c.	1	12.42	1	2.95	27	n.c.	1	1.29	1	0.72	5.94	5.07	5.26	2.81		
2	2.57	34	5.22	2	GND	2	5.68	28	3.21	2	n.c.	2	GND	9.67	5.90	GND	9.01		
3	0.00	35	5.26	3	GND	3	0.00	29	2.70	3	6.31	3	GND	5.27	5.94	5.25	2.21		
4	3.44	36	0.00	4	GND	4	0.00	30	2.77	4	0.90	4	0.90						
5	5.27	37	n.c.	5	GND	5	0.00	31	4.68	5	0.00	5	0.00						
6	2.61	38	GND	6	GND	6	4.26	32	2.14	6	8.96	6	8.96						
7	0.00	39	0.15	7	GND	7	12.42	33	3.04	7	9.03	7	9.03						
8	GND	40	4.37	8	GND	8	5.27	34	2.63	8	3.17	8	3.17						
9	n.c.	41	0.00	9	GND	9	4.99	35	3.50	9	3.16	9	3.16						
10	5.25	42	n.c.	10	GND	10	0.00	36	0.40	10	3.21	10	3.21						
11	0.45	43	0.00	11	GND	11	8.23	37	9.01	11	4.25	37	4.25						
12	GND	44	0.00	12	GND	12	8.23	38	4.04	12	3.31	38	3.31						
13	2.63	45	0.23	13	GND	13	89.23	39	4.32	13	3.47	39	3.47						
14	n.c.	46	0.00	14	GND	14	4.12	40	4.68	14	0.00	40	0.00						
15	n.c.	47	n.c.	15	GND	15	131.37	41	4.39	15	3.44	41	3.44						
16	n.c.	48	n.c.	16	GND	16	262.67	42	4.97	16	3.54	42	3.54						
17	n.c.	49	n.c.	17	GND	17	4.06	43	3.53	17	GND	43	GND						
18	0.59	50	n.c.	18	GND	18	4.97	44	GND	18	4.28	44	4.28						
19	n.c.	51	n.c.	19	GND	19	3.04	45	0.45	19	0.76	45	0.76						
20	n.c.	52	n.c.	20	GND	20	2.01	46	6.09	20	9.00	46	9.00						
21	n.c.	53	0.00	21	GND	21	0.00	47	4.09	21	GND	47	GND						
22	5.26	54	n.c.	22	GND	22	11	4.13	2.25	22	9.09	48	9.09						
23	0.00	55	n.c.	23	GND	23	89.23	49	5.41	23	11	4.13	49	5.41					
24	n.c.	56	n.c.	24	GND	24	13.41	50	0.90	24	19.45	51	19.45						
25	1.30	57	0.00	25	GND	25	24.54	51	6.46	25	0.00	52	0.00						
26	1.83	58	0.00	26	GND	26	0.00	52	4.15	26	0.00	53	0.00						
27	GND	59	4.27	27	GND	27	0.00	53	4.28	27	0.00	54	0.00						
28	n.c.	60	4.28	28	GND	28	0.00	54	4.15	28	0.00	55	0.00						
29	n.c.	61	5.27	29	GND	29	0.00	55	4.15	29	0.00	56	0.00						
30	n.c.	62	n.c.	30	GND	30	0.00	56	4.15	30	0.00	57	0.00						
31	5.21	63	2.26	31	GND	31	0.00	57	4.15	31	0.00	58	0.00						
32	n.c.	64	GND	32	GND	32	0.00	58	4.15	32	0.00	59	0.00						

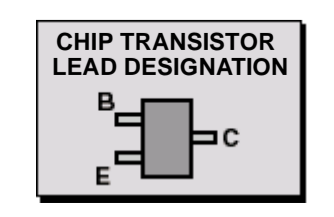
** Probing pin may cause television shut down or blanking the CRT.

Notes:

Check Parts List for most recent component values and part numbers. Obtain voltages with a digital multimeter.

Boards Designation

- A-Board - Main Board



Voltage Measurements

- Voltage measurement:
 - AC input to the Receiver is 120V.
 - NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black).
 - All Picture and Audio adjustments are set to Normalize.
 - TV ANT/CABLE - (Get-Up Menu) in TV/ANT Mode
 - Volume - Min.
 - TV/Video SW - TV position
 - Audio Mode - Stereo
- Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
- Supply voltages are nominal.
- Ground symbol ⊕ indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

Waveform Measurements

- ⊙ indicates waveform measurement. Measurement can be taken at the best accessible location in common to the indicated point.
- Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
- Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
- All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
- Ground symbol ⊕ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

Schematic Notes

- Resistors are carbon 1/4W unless noted otherwise.
- Capacitors are ceramic 50V unless noted otherwise.
- Coil value notes is inductance in µH.
- Test point indicated by ↑. Test point but no pin.
- Components indicated with Δ are critical parts and replacement should be made with manufacturer specified replacement parts only.
- (BOLD LINE) indicates the route of B+ supply.
- The schematic diagrams are current at the time of printing and are subject to change without notice.
- Ground symbol ⊕ indicates HOT GROUND CONNECTION; ⊕ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A Δ IN THE SCHEMATIC.